Association between mitochondrial DNA variations and Alzheimer's disease in the ADNI cohort.

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Public Summary:

Scientific Abstract:
Despite the central role of amyloid deposition in the development of Alzheimer's disease (AD), the pathogenesis of AD still remains elusive at the molecular level. Increasing evidence suggests that compromised mitochondrial function contributes to the aging process and thus may increase the risk of AD. Dysfunctional mitochondria contribute to reactive oxygen species (ROS) which can lead to extensive macromolecule oxidative damage and the progression of amyloid pathology. Oxidative stress and amyloid toxicity leave neurons chemically vulnerable. Because the brain relies on aerobic metabolism, it is apparent that mitochondria are critical for the cerebral function. Mitochondrial DNA sequence changes could shift cell dynamics and facilitate neuronal vulnerability. Therefore we postulated that mitochondrial DNA sequence polymorphisms may increase the risk of AD. We evaluated the role of mitochondrial haplogroups derived from 138 mitochondrial polymorphisms in 358 Caucasian Alzheimer's Disease Neuroimaging Initiative (ADNI) subjects. Our results indicate that the mitochondrial haplogroup UK may confer genetic susceptibility to AD independently of the apolipoprotein E4 (APOE4) allele.